DOCUMENT RESUME

ED 189 973 HE 012 896

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TITLE A Model for Information Systems Planning and Evaluation. AIR Forum 1980 Paper.
PUB DATE Apr 80
NOTE 34p.; Paper presented at the Annual Forum of the Association for Institutional Research (20th, Atlanta, GA, April 27-May 1, 1980).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Administrator Role; *College Administration; Data Processing; Decision Making; Followup Studies; Higher Education; *Information Utilization; *Institutional Research; *Management Information Systems; Models; Operations Research; Program Effectiveness; *Program Evaluation; Program Implementation; State Boards of Education; State Colleges; Systems Approach
IDENTIFIERS *AIR Forum 1980; *State University System of Florida

ABSTRACT

A planning and evaluation model for management information systems (MIS) at the institutional or system level in higher education is presented. The procedure provides an analytical approach for assessing the effectiveness of an existing information system utilizing a variation of the Business Systems Planning methodology developed by the IBM Corporation. The model emphasizes involvement of top level administrators in the MIS planning and evaluation process and uses followup procedures to monitor system changes and improve MIS planning. An example of the use of the model in the State University System of Florida is presented. (Author/SW)

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A MODEL FOR INFORMATION SYSTEMS PLANNING AND EVALUATION

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THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

This paper was presented at the Twentieth Annual Forum of the Association for Institutional Research held at the Peachtree Plaza Hotel in Atlanta, Georgia, April 27 - May 1, 1980. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum papers.

Mary Corcoran
University of Minnesota
(Editor, AIR Forum Publications)

ABSTRACT

A model for the planning and evaluation of Management Information Systems at the institutional or system level in higher education is presented. The procedure provides an analytical approach for assessing the effectiveness of an existing information system utilizing a variation of the Business Systems Planning methodology developed by the IBM Corporation. The model emphasizes involvement of top level administrators in the MIS planning and evaluation process and uses follow-up procedures to monitor system changes and improve MIS planning. An example of the use of the model in the State University System of Florida is presented.

The authors wish to acknowledge the efforts and assistance of Dr. Sharon Topping, Coordinator, Management System Design, State University System of Florida, who directed the State University System MIS study and evaluation.

A MODEL FOR INFORMATION SYSTEMS PLANNING AND EVALUATION

A major challenge of the Eighties will be to develop effective, efficient management information systems (MIS) that meet the needs of the decision maker. Over the past two decades MIS development has increased markedly with minimal concern for either efficiency or control. Joseph (1980) predicted that during the next decade there will be major technological advances in the computer field with further application diversity, widespread exparsion of systems, and lower cost hardware. However, in all probability the expansion of computer use will be accompanied with a shortage of trained personnel. Gilchrist (1980) predicts that programmers will be in short supply and that all of the problems inherent in the environment in which there is a shortage of well trained personnel will continue throughout the 1980s.

The expanded usage and increased expectations of information systems will continue throughout the next decade. The discussion of using Higher Education General Information Survey (HEGIS) data as a national data base, of developing information exchange programs and of using the National Center for Higher Education Management Systems (NCHEMS) information exchange procedures, as well as the increased number of post secondary education systems that have developed large management information systems are mere illustrations of how MIS has expanded into an amorphous structure. The increased use of computers will be accompanied with greater expectations, and cost of computing will continue to be an important factor. The State University System of Florida

expended over $13 million in fiscal year 1976-77 for hardware, software and personnel. It is projected that over $24 million will be expended in fiscal 1979-80. In 1978, McLaughlin reported that the annual cost of participating in the NCHEMS Information Exchange Procedures (IEP) system was between $2 and $3.50 per FTE student.

Top level administrators normally have not been involved in determining what information is needed to support the decision making process or in the type of computer hardware and software that is acquired. However, the vast expenditure for computing in a time of declining enrollment and shrinking budgets will in all probability attract the executive administrator's attention. Further, the reported ineffectiveness of most large management information systems will surely come under greater scrutiny by the top executives who need reliable, timely information to support their decisions.

It is the thesis of this paper that we as institutional research personnel must address this issue and develop a procedure to assess the effectiveness of the total information system as well as the component parts. It is the purpose of this paper to present a management information systems evaluation and planning model that can be utilized at the institution or system level. The specific objectives are to:

1. Present a model for MIS evaluation and planning.
2. Present the results of an MIS follow-up survey completed one and one half years after the State University System

of Florida MIS was evaluated.

HISTORICAL PERSPECTIVE

Management information systems usually have been developed to support the decision making process of an institution. Although executive management depends on data to provide supporting rationale for their actions, they have not shown any interest in the development or assessment of system effectiveness. Both design and development have been left to the analyst and programmer who usually are not aware of the functions or the critical decisions administrators must address. In addition, institutional and systems personnel have not assessed the effectiveness of the system in providing timely, accurate data or in developing procedures to control computer resource utilization. The literature reveals widespread dissatisfaction with current management information systems. McCorkle (1977) stated that top management's inability to determine the type of information to be assembled and to determine how it should be used, has been the major problem. Speaking of the Canadian system, Trotter and Creet (1978) indicated that Canada's present day information systems in higher education are ineffective in meeting their needs. Further, they stated that planners and policy makers in addition to formulators and users must be involved in the formulation of information systems. In a recent publication of the Association of Institutional Research entitled Appraising Information Needs of Decision Makers, Sandin, a management systems

expert, stated,

> . . . information system design has often been an abstraction, dealing not with how the world actually is, but with how it ought to be. It is in the world as we find it that information systems have to be installed and utilized. In that world, information systems are often not justifiable under their own decision rules because they do not produce benefits and justify their costs. Further, since systems were not designed in response to the specific information needs of the user, they have not led to the promised benefits for decision makers.

Past practices have resulted in management information systems that have not responded to the requirement for relevant, timely, consistent data to support the decision making process. The lack of proper planning, management, control, and evaluation has usually resulted in fragmented systems serving multiple users with conflicting objectives and diverse needs. The resultant effect has been unmanaged systems that have been unwieldly, ineffective and costly to operate. Although inadequate supporting software for large systems can be blamed for part of the shortcoming, executive administrators in higher education have not taken a leadership role in the planning and development of management of MIS. Even though software development will in all probability realize its full potential during the next decade, the management void must be filled if management information

systems are to provide reliable information in a timely, cost effective manner.

MIS EVALUATION AND PLANNING MODEL

In 1970, IBM established the Business Systems Planning (BSP) program. This model for MIS evaluation and planning was based on the BSP methodology. However, due to the uniqueness of the higher education environment, numerous changes were made in the procedure. The model utilizes the "top down" approach for determining information needs and for assessing the effectiveness of the existing system in meeting both current and future information requirements. The basic tenets of BSP and this model are as follows:

1. MIS development requires top down planning with bottom-up implementation.
2. Data is an institutional resource.
3. Information supports functional processes.
4. A structured, proven methodology should be used for assessment and evaluation.

In recent years several institutions and university systems have attempted to assess the effectiveness of their management information systems in meeting the information needs to support the decision making process. Of those institutions which have attempted to address the issue of MIS assessment, many have used the IBM Business Systems Planning (BSP) process. In addition to the BSP process, this model draws upon the procedure utilized by

the State University System of Florida (SUS) study team in assessing the effectiveness of the SUS MIS system.

For clarity of presentation the current model has been divided into four phases. They are as follows:

1. Planning
2. Study Execution
3. System Implementation
4. Follow-up and Evaluation

PLANNING

The planning phase serves to develop an understanding of the organizational structure of the institution and the functional responsibilities of each manager. One of the primary products of this phase is matrices that show the interrelationships between administrative organization, functional processes, data sources, and application systems. The matrices used in the SUS of Florida study are provided on the following page. The basic steps in this phase are to:

1. gain the commitment of executive administrators
2. select study team members and a team leader
3. secure proper office facilities and equipment
4. train the study team
5. determine the study's scope and goals
6. complete an orientation program
7. identify the organization structure, functional processes, data sources, and application systems

FUNCTIONAL PROCESSES	APPLICATION SYSTEMS	DATA SOURCES	ORGANIZATION STRUCTURE
Alumni/Development			
Resource Acquisition			
Monitoring resource Utilization			
Alumni Program/Serv			
Alumni Tracking			
Curriculum/Instruction			
Assessment of Needs			
Design of Curriculum			
Courses Instruction			
Curr & Course Eval			
Scheduling			
Ext. Comm & Relations			
Public Relations			
Public Service			
Institutional Aff.			
Individual Aff.			
Facilities & Equip.			
Acquisition/Disposition			
Construction/Alteration			
Operations/Maint.			
Allocation & Sch.			
Rental Property Mgt			
Security			
Financial			
Collections of Rec.			
Stewardship of Funds			
Disbursement of Funds			
Management of Funds			
Financial Services			
Protection Against Fin. Liabilities			
Goods & Services			
Assessment of Needs			
Acquisition			
Inventory of Expend			
Distribution			
Institutional Planning			
Goal Dev.			
Strategic Planning			
Tactical Planning (Integ)			
Tactical Planning (Meas)			
Budgeting Resources			
Personnel			
Recruiting			
Career Dev & Ev.			
Salary & Benefits			
Employee Relations			
Compliance/Gov't			
Assign & Teaching Res.			
Research -Creative Act			
Identification			
Support Procurement			
Performance of Inq.			
Student			
Adm & Matriculation			
Registration			
Student Act.			
Advising & Eval.			
Student Status			
Financial Aid			

	Personnel	FINANCIAL	Chan./Pres EXEC. MGMT
	PERSONNEL ADMINISTRAT		VC/VP ACAD AFF.
	PERSONNEL REPORTING		VC/DIR ADM. AFF.
	PAYROLL & BENEFITS	PERSONNEL	VP-VC STUDENT AFF.
	BUDGET		PLANNING
	BUDGET ADMINISTRATION		VP-VC-DIR BUDGET
	BUDGET PLANNING		DIR EMPLOYEE REL
	FISCAL MANAGEMENT		VP-DIR PUBLIC AFF.
	ACCOUNTING		DIR ACCOUNTING
	PURCHASING		DIR PERSONNEL
	INVENTORY		" PERSONNEL
	CURRICULUM & INSTRUCTION		" PURCHASING
	COURSE CATALOG		" ADM. SVCS
	SCHEDULE OF COURSES		" FIN. A.D
	COURSE DISTRIBUTION & UTILIZATION	STUDENT	- REGISTRAR
	STUDENT		DIR - ADMISSIONS
	ADMISSIONS		ADM. BRANCH ADM
	REGISTRATION		RESEARCH INSTITUTIONAL
	FINANCIAL AID		DIR MGM'T INFO
	EVALUATION & ADVISING		DIR COMPUTER SVCS
	RECORDS & REPORTING		DIR COMPUTER SYSTEM
	ALUMNI & DEVELOPMENT		DIR PHYSICAL PLANT
	ALUMNI TRACKING & SERVICE		COLLEGE - DEAN - PROVOST
	CONTRIBUTION & PROMOTION		VP - ACA. AFF.
	DEVELOPMENT		VP-Dean HEALTH AFF
	FOUNDATION FUND ADM		DEAN-DIR. RESEARCH & SPON.
	FACILITIES		DEAN - GRADUATE -
	INVENTORY & UTILIZATION		
	ALLOCATION & SCHEDULING		
	CONSTRUCTION		
	MAINTENANCE		
	INSTITUTIONAL RESEARCH		
	(LIBRARY & MEDIA)	LIBRARY	
	CIRCULATION		
	INVENTORY MAINTEN		
	ACQUISITIONS		
		RESEARCH/ PUBLIC SERVICE	
		EXTERNAL ENVIRONMENT	

8. determine the structure of the final reports
9. develop action plans

Gain Executive Commitment

The implementation of the information systems planning study recommendations will be contingent on having the commitment of the executive administration. Executive commitment and involvement is essential to the overall success of the project.

Select a Study Team

A study team of approximately four members, in addition to the executive sponsor, should be selected from the top three levels of management. Members should be selected on the basis of their competencies, diverse backgrounds, and knowledge of the institution. Although each member should be highly regarded at the institution, it is essential that the team leader has the respect of both the executive administration and information systems personnel.

Secure Proper Facilities and Equipment

The working environment of the study team has a substantial bearing on the success of the project. It is essential that the facility enables the study team to function without the normal everyday interference of routine institutional responsibilities and provides for the security of information collected in the interviews. The interview room must be properly equipped with visuals and all interviews should be scheduled in the interview room.

Train the Study Team

The success of the project depends on proper training of the study team in information systems planning procedures. The IBM BSP school provides the appropriate training. In addition, the use of consultants to assist in the in-service training of study team members and in providing technical expertise while the study is being completed is helpful. It is essential that the study team develop interview techniques, proper interview formats, and efficient, effective ways of preparing interview summaries.

Determine the Study's Scope and Goals

The scope of the study must be defined to assist the study team in carrying out their investigation. The study is normally delimited by the executive administration. The study goals must be clearly stated, directly related to the scope and measurable.

Complete an Orientation Program

The orientation of the study team should contain a brief overview of the institution's mission and goals, a report of the current information system and future plans, and background information on the functional responsibilities of key executives.

Identify the Organization Structure, Functional Processes, Data Sources and Application Systems

The determination of organization structure and functional processes as they relate to information is one of the most important outcomes of the study. It is essential that each functional process be identified and defined. Once functional

process definitions are agreed on by the team, matrices showing the interrelationship between processes, organizational unit, application systems data source can be developed. The resulting matrices are basic for the remainder of the study. The process-organization quadrant will be used extensively in preparing for and conducting interview sessions.

Determine the Final Report Structure

It is essential that the study team develop an outline of the final report prior to entering the interview stage of the study. A thorough understanding of what is expected will improve the quality of the interviews and increase the overall effectiveness of the study.

Develop Action Plans

A Gantt Chart can be utilized in developing an action plan for each phase. This instrument shows the task being completed and the time frame in which each task must be completed. Table 1 provides an illustration of how the Gantt Chart can be utilized to plan and to coordinate the activities of the study.

STUDY EXECUTION

The fact gathering phase provides the study team with the opportunity to determine which administrative unit has the primary decision responsibilities in each functional process area, the current and future needs for information, and the effectiveness of the information system. Executive interviews are an integral part of the study. In addition to gaining executive

TABLE 1
ACTION PLAN

Task	Planning				Study Execution			Implementation	Follow-up
	Part-time				Full-time			PT	PT
	1 Week	2 Weeks	1 Week	1 Week	1 Week	1 Week	1 Week	Variable Time	Variable Time
Gain commitment) Select team)	——								
Train team		——							
Determine scope			–						
Develop goals			–						
Complete orientation program			——						
Identify organization structure			–						
Define functional processes			——						
Identify data sources			–						
Identify application system			–						
Finalize matrix			——						
Determine report structure				–					
Develop Phase II Action Plan				–					
Select Interviewees				–					
Develop interview schedule				——					
Conduct Interviews					——	——			
Analyze findings					——	——			
Write report			–	–	–	——	——		
Present findings and recommendations							–		

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administrative input on information needs, major decision process areas, adequacy of operational systems, and future information needs; validation of interrelationships between administrative organization and functional process responsibilities is an outcome of this activity. The basic components of this phase are:

1. selecting the interviewees
2. developing the interview schedule
3. conducting interviews
4. verifying the interview outcomes
5. analyzing findings
6. preparing the final report
7. presenting the findings and recommendations

Selecting the Interviewees

One executive administrator from each organization area within the scope of the study should be interviewed. The interviewees are normally selected from the top three levels of the administration. It is essential that all key decision makers be selected.

Developing the Interview Schedule

Interview sessions are normally two hours. The ideal number of interviews for any one day is two and the maximum number of interviews should not exceed three. Due to the pre-interview and post-interview activities of the study team, it is necessary to have at least one and one-half hours between any two interviews. It is essential to arrange the interview schedule so

that all key personnel are interviewed.

Each interviewee should be formally invited to participate in the study. The executive sponsor should contact each person and explain the objectives and procedures of the information systems planning study. In addition, each person should be provided with a list of the topics to be discussed, a topical outline and a copy of the functional processes definitions.

Conducting the Interviews

The effectiveness of any interview is dependent upon successful pre-interview planning, interview techniques, and a post-interview session. In addition to developing a common set of questions that will normally be used in all interviews, it is necessary for the study team to spend at least one-half hour preparing for the interview. By reviewing the specific functional process responsibilities of the administrative unit and the relationship between data systems, application systems and processes, specific questions should be formulated for each interview session. It is the responsibility of the study team to make sure each interview is well organized and that each interviewee has the opportunity to address relevant questions concerning the organizational unit and the opportunity to discuss information needs related to any other area. Since the primary responsibility of the study team is to gather information, team members should be assigned specific responsibilities. An interview team should be limited to three members. Each team member should be assigned a specific responsibility. To insure

that the study team is prepared for the first interview, team members should role play their activity and the results should be critiqued prior to conducting the first executive interview.

Verifying the Interview Outcomes

During the interview session one study team member should take verbatim notes of the interview session. The other study team members should take notes on relevant topics. Following the interview session, the study team members should hold a post-interview session to identify relevant issues and problems and decide what information should become part of the official interview. Normally, the entire interview session would be transcribed; however, in some cases the interviewee may wish to share information with the interview team yet keep it off the record. The interview report should be prepared by one member and reviewed by the entire team before the final copy is prepared. The interview outcome should be mailed to the interviewee for verification within 24 hours of the interview session. The interviewee should be asked to review the document, make any corrections or deletions, be given the opportunity to add additional information when it is appropriate, and return the document within 48 hours.

Analyzing the Findings

Important items from each interview report should be placed on 3 x 5 note cards. Note cards should be referenced by broad functional process area, organizational unit affected, application

system, and information problem. Data cards should be organized into appropriate categories to identify strengths, weaknesses, common problems, and information needs.

Preparing the Final Report

The final report should be relatively brief. Since information is provided to support processes regardless of the organization structure, the final report should be organized along functional process categories. It is recommended that the positive findings be summarized in a brief section. A brief summary including the findings, study team's conclusions, team recommendation, and the potential benefit from implementing the team's recommendations should be provided for each functional process which is identified as having an information need. In addition, the system needs should be prioritized. Those which have the greatest potential to benefit the institution should be ranked first regardless of the organizational units affected. In addition to major system recommendations, numerous problems can be solved with policy development, improved communication, and distribution of existing information. These items should be considered as short range outcomes. They should be implemented immediately by the appropriate administrative unit under the supervision of the study team. The achievement of the short range goals add stature to the information systems planning study in that executives see a positive outcome of the study which benefits the entire institution. This will enhance the cooperation of the executive administrators in implementing the

long range plan and increase the effectiveness of the project. The study team's recommendations should be specific, well founded and be time oriented. It is essential that each recommendation be analyzed so that it provides a long range solution that impacts all affected organizational units and is cost effective. For example, suppose the collection and reporting of fees is a serious problem at the institution. If an integrated system which ties the registration-assessment function to an on-line collection process were implemented across organizational lines, it would in all probability resolve the problem. Since these functional processes cross organizational units, it is necessary to develop an institutional system to address the problem.

Presenting the Findings and Recommendations

A formal presentation should be made to the administration and management information staff. The basic purpose is to present a summary of the findings and discuss in detail the recommendations and associated benefits. The implementation phase action plan should be a vital component of the presentation and should enable the institution to proceed with the implementation of the plan.

SYSTEM IMPLEMENTATION

The success of any information system depends on proper management control and comprehensive planning of system development. Once information needs have been determined by the "top down" approach, implementation with proper management control

can be completed from the "bottom up." Expert consultants should be used in reviewing implementation and systems design plans. This practice will improve the overall quality of the system. The basic steps for this phase are:

1. developing a management control structure
2. developing an implementation plan
3. completing cost effectiveness studies of new systems
4. developing an implementation schedule
5. monitoring the implementation schedule

Developing Management Control

One executive officer must be assigned the responsibility of reviewing and approving system development. The individual must have management skills, be knowledgeable about the important decisions being made within the institution, and be able to assess the cost effectiveness of an information system. The management control structure is the most important function in the development of a responsive information system. This step is most often omitted in systems development.

Developing Implementation Plan

Based on the study team's recommendation, implementation plans should be developed from the bottom up. These plans should be reviewed from the institutional perspective to insure that functional process information needs are being met across organizational lines. Review and approval by management control personnel will insure that the systems being developed serve the

entire institution.

Completing Cost Effectiveness Studies

Prior to scheduling any new system for implementation, a comprehensive cost effectiveness study must be completed. This study should include system benefits, personnel redistribution and associated costs, system development costs, annual operating costs, and viable alternatives. Once the implementation plans have been developed and the cost effectiveness study has been completed, the system should be presented for final administrative approval.

Developing Implementation Schedule

System development should be coordinated across organizational units. The use of a Gantt Chart can be utilized to monitor implementation schedules and workload distribution assignments to insure that new system development can be an on-going, organized process that runs parallel with the day-to-day operation.

Monitoring Implementation Schedule

In the development of integrated systems, it is essential that system implementation be monitored closely. This becomes a function of management. The utilization of the Gantt Chart and periodic reports from the systems personnel will greatly enhance the probability of implementing a unified, effective system.

FOLLOW-UP AND EVALUATION

Follow-up and evaluation studies become a part of the overall plan. These activities enable the institution to determine what progress has been made and provide direction to insure that the information system is responsive to the needs of the executive administrator. Further, it provides direction to insure that the system is responsive to the major functional process needs rather than one over-zealous administrator. Information system cost effectiveness studies will help control computer expense per unit output. Although most users will insist that they need additional computer services, the chargeback of expenses will cause users to purge unnecessary outputs. Further, the cost effectiveness study will provide the executive administrator with the information needed to properly manage his units prior to the development of the system. All too often the executive administrator is appraised of the cost of operating a system after it has been developed and operated for more than a year. At this time the administrator is faced with very few alternatives other than continuing the system and trying to improve it. The basic steps of this phase are:

1. completing the follow-up study
2. preparing the summary report and recommendations
3. completing the information support and cost effectiveness studies

Completing Follow-up Study

The first follow-up study should be completed within two years of the initial study. This study can be completed by the original study team with a survey instrument. Additional follow-up studies should be completed on a biennial basis. The procedure may involve interviews with selected executive administrators as well as a survey. Membership in the study team should be changed gradually so as to provide additional insight and new ideas while maintaining continuity.

Preparing Summary Report and Recommendations

Follow-up study reports should be brief. However, it is essential that the report provides information on the progress being made and further recommendations. Although it is not essential, it is recommended that a five year information systems development plan be the output of each biennial follow-up study.

Completing Information Support and Cost Effectiveness Studies

Each biennial report should address the effectiveness of the information system in meeting the organization's information needs as well as the cost effectiveness of the information system. It is essential that the cost per unit output be monitored in both the administrative and instruction and research areas. Although computer applications in both the classroom and administrative offices are essential, a proper balance must be maintained between administrative overhead costs and the amount of funds expended by instruction and research. This can only be addressed

when information and computer time are considered to be resources of the institution that are monitored and allocated as are dollars and space.

THE STATE UNIVERSITY SYSTEM OF FLORIDA MIS STUDY

In 1978, the State University System of Florida completed an information systems planning study. Although the study was to have been based on the IBM BSP methodology, the procedure was modified to meet the unique needs of the multi-campus state university system. However, the system employed the basic tenets of BSP and stated the following goals:

1. determine problems in information flow
2. eliminate ad hoc systems development
3. provide stable information systems
4. establish planning capability in the SUS.
5. establish a five-year plan for information systems development
6. provide systemwide standards for decentralization
7. enhance the relationship of SUS with outside agencies
8. enhance the relationship between the BOR office and the universities

After participating in an IBM training program, the study team (4 three-member teams of SUS administrators) completed approximately 150 executive interviews over a 5 week period. Top level administrators from SUS institutions, Board of Regents

staff members, legislators, members of the legislative staff, and state agency personnel were included in the study.

Five system needs were identified from the study. The systems and the implementation priorities were as follows:

1. Financial Aid System — 1st priority
2. Student Fee Collection System — 2nd priority
3. Contract and Grant System — 3rd priority
4. Alumni Tracking — 4th priority
5. Auxiliary Services — 5th priority

In addition to systems problems, management control and communication were identified as problem areas. To insure that the necessary management control procedures were developed, the study team made recommendations in 13 areas related to management control and communication. Table 2 provides an illustration of the type of action the team recommended to correct existing problems in the enrollment projections and future systems software development activities.

TABLE 2

MANAGEMENT CONTROL RECOMMENDATIONS
BY ACTIVITY AND ACTION

Activity	Recommended Action
Enrollment Projections	Documentation Publication Coordination
Future Systems Software Development	Decentralization Range of Options Criteria

The SUS study revealed that accurate and consistent enrollment projections were essential to facilitate SUS planning and to enhance SUS credibility with external agencies. The study team concluded that:

1. An enrollment projection procedure should be documented and widely circulated to the SUS institutions and academic community. Further, to enhance consistency, a multi-year procedure should be adopted.
2. Enrollment statistics comparing actual enrollments to projected enrollments should be published annually to eliminate accusations that enrollment projections were inappropriately manipulated to affect SUS and institutional funding.
3. The SUS enrollment projection procedures process should be coordinated with other divisions of the Department of Education to eliminate double counting and to enhance consistency through use of the same set of assumptions.

Software Systems Development was perceived to be too centralized by university personnel. The study team concluded that policies regulating future systems development should be developed and recommended that:

1. decisions regarding implementation of systems development be decentralized to the universities and that the Board of Regents exercise the right to mandate common systems in all universities only when:
   a. it was a legal requirement

b. SUS accountability demands from external agencies could not be met in any other manner

c. cost benefit analysis clearly supported the action

2. a range of options be developed for future systems development that would encompass a continuum of commonality. The greatest degree of commonality would be a complete system that included common transactions from a common data base. The least would be a common reporting format.

3. criteria be developed to facilitate decisions concerning the degree of commonality desired for future systems development

To facilitate the implementation of the management control and systems development recommendations, an Action Plan was developed for each area. The Action Plan identified the time frame for completion of each recommendation and administrative responsibility by action area or system.

During the Fall of 1979, approximately one year after completion of the study, a follow-up study was conducted to determine what changes occurred since the information systems planning study had been conducted. A survey was developed by a sub-group of the original study team. Each SUS and Board staff interviewee who participated in the study was asked to complete the survey. Participants were asked to assess observed improvements and delineate those problems which remained.

There were six basic objectives of the follow-up study.

They were as follows:

1. to determine if the quality of information had improved
2. to determine if the quantity of ad hoc data requests had been decreased
3. to determine if communication among SUS constituencies had improved
4. to identify continuing information and/or communication problems
5. to establish a priority for resolving continuing problems
6. to determine what changes had occurred since the ISP study had been conducted that might change the original study recommendations

Approximately 80 percent of the participants returned usable responses. Table 3 provides a summary of the survey results. The findings revealed that improvements had occurred in most management control areas and that only minor changes had occurred in the systems development area. Fourteen areas were identified in which 50 percent or more of the respondents indicated that no change had been made. These areas ranged from communication to systems development. Five areas were identified as currently having serious problems by 50 percent or more of those who were able to respond to the question. These areas included the level of service provided by regional data centers, timing of development and implementation of common SUS UNIFTRAN systems, provisions of adequate resources for development and

TABLE 3

RESULTS--SUS SYSTEMS PLANNING STUDY SURVEY

Activity	Improvement				Current Status			
	Greatly Improved	Improved	Slightly Improved	No Change	Serious Problem	Slight Problem	No Significant Problem	Unable to Comment
Continuity and Documentation of Budgeting Process:								
(1) Request Budget	2%	25%	35%	38%	17%	25%	23%	35%
(2) Allocation Budget	2%	30%	50%	18%	22%	25%	23%	30%
(3) Operating Budget	9%	50%	24%	17%	15%	15%	37%	33%
Enrollment Reporting								
(4) Timeliness	0%	38%	27%	35%	15%	23%	26%	36%
Communication and Coordination								
(5) BOR Central Office	7%	39%	31%	23%	12%	44%	33%	11%
(6) Among Universities	1%	15%	25%	59%	7%	38%	41%	14%
(7) With Legislators	5%	26%	34%	35%	12%	19%	31%	38%
(8) With Other State Agencies	0%	22%	22%	56%	12%	25%	29%	34%
Regional Data Centers								
(9) Level of Service	4%	35%	22%	39%	34%	12%	20%	34%
(10) Transferability of Systems	5%	12%	28%	55%	18%	23%	12%	47%
Collection & Reporting of Information								
(11) Quality	3%	24%	56%	17%	15%	34%	29%	22%
(12) Reduction of Data Requests	2%	33%	35%	30%	14%	38%	18%	30%
(13) Sharing Analysis and Reports with Universities	0%	33%	25%	42%	8%	24%	39%	29%
System-wide Planning								
(14) Existence of Guidelines and Policies	4%	29%	34%	33%	16%	34%	24%	26%
(15) Existence of Planning Data Base	2%	16%	29%	53%	12%	26%	21%	41%
Enrollment Projections								
(16) Documentation of Procedures	2%	32%	30%	36%	18%	35%	18%	46%
UNIFTRAN								
(17) Timing of Developments and Implementation	4%	18%	28%	50%	44%	13%	10%	33%
(18) Provision of Adequate Resources for Development & Implementation	2%	18%	30%	50%	41%	14%	6%	39%
(19) Communication & Coordination	8%	28%	36%	28%	22%	29%	17%	32%
(20) Effectiveness of Products								
(a) Fiscal	0%	37%	27%	36%	24%	22%	8%	46%
(b) Academic	0%	27%	30%	43%	12%	17%	5%	66%
Expenditure Analysis								
(21) Internal Usage by Universities	0%	12%	28%	60%	16%	16%	27%	41%
Career & Management Development								
(22) Existence of Career Development Opportunities	0%	18%	22%	60%	14%	29%	24%	33%
Financial Formatting								
(23) Availability of Summarized Financial Data	2%	16%	29%	53%	6%	23%	31%	40%
(24) Availability of Simplified Departmental Ledger Reports	0%	13%	19%	68%	16%	32%	20%	32%
System Development								
(25) Financial Aid	21%	26%	19%	34%	36%	10%	10%	44%
(26) Student Fee Collection	0%	11%	19%	70%	30%	12%	6%	52%
(27) Contracts & Grants	0%	3%	14%	83%	21%	12%	18%	49%
(28) Alumni Tracking	3%	3%	32%	62%	10%	14%	15%	61%
(29) Auxiliary Services	0%	0%	22%	78%	5%	17%	22%	56%

implementation of UNIFTRAN systems, the financial aid system and the student fee collection system. It is anticipated that the results of the follow-up study will be used to make further changes in the long range systems development planning throughout the SUS.

SUMMARY

This model provides an analytical approach for assessing the effectiveness of a management information system at either the institution or systemwide level. The model involves top management in assessing the effectiveness of the management information system as it relates to the functional responsibilities of each executive and the institution. This analytical tool is readily transferable and will enable institutional research personnel to assess the effectiveness of an MI system. The SUS study and follow-up results illustrate how the information systems planning approach can be used to enhance long range system development.

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